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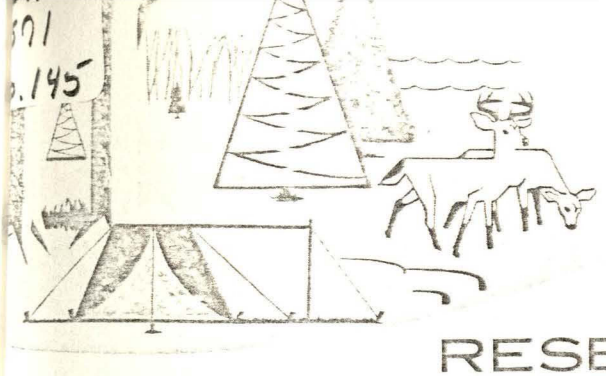

USDA FOREST SERVICE

RESEARCH NOTE NC-145

NORTH CENTRAL FOREST EXPERIMENT STATION, FOREST SERVICE—U.S. DEPARTMENT OF AGRICULTURE

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ROCKY MOUNTAIN STATION

TIMBER VOLUME IN WISCONSIN COUNTIES

ABSTRACT.—The third forest survey of Wisconsin showed timber volume reaching 11 billion cubic feet of growing stock in 1968, an increase of about one-third since 1956. The growing stock included 22 million board feet of sawtimber.

OXFORD: 524.61:612(775). KEY WORDS: growing stock, sawtimber, species.

Wisconsin's 14.5 million acres of commercial forest land supported 11 billion cubic feet of growing stock in 1968 (tables 1 and 2). This is an increase of 30 percent since the last inventory in 1956, despite a decrease in the commercial forest land base.[1] Included in the growing stock are 22 billion board feet of sawtimber (tables 3 and 4), expanded from 16 billion in 1956. These increased volumes reflect both an improvement in stocking, with an increase of 25 percent in the number of growing stock trees 5.0 inches d.b.h. and larger, and a maturing of Wisconsin's second-growth forests, with average sawtimber volume increasing from 1,065 to 1,497 board feet per acre in 12 years.

Even with this large expansion of second-growth timber, small trees still dominate the forests. Almost 80 percent of all merchantable trees fall into the 5- to 9-inch diameter class.

[1] *The 1956 volumes have been adjusted to 1968 standards to make comparisons between the two surveys possible.*

In terms of total volume, aspen is still the most abundant species in Wisconsin; it constitutes 20 percent of the growing stock. Other prominent species are northern red oak, sugar maple, paper birch and elm. These five species make up one-half of the growing stock volume in Wisconsin. Paper birch, with its volume doubling, moved from the eighth most plentiful species in 1956 to the fourth in 1968. The following tabulation shows volumes of these species:

Species	*Million cubic feet*
Aspen	2,159
Northern red oak	993
Hard maple	938
Paper birch	728
Elm group	695

Turning from growing stock to sawtimber volume, we find a slightly different order. Northern red oak, sugar maple, aspen, white pine and elm, in that order, are the most abundant species. Aspen sawtimber volume increased almost threefold, moving from the eighth to third place. Tabulated below are the sawtimber volumes of these species:

Species	*Million board feet*
Northern red oak	2,889
Hard maple	2,119
Aspen	2,109
White pine	1,945
Elm group	1,907

Table 1. –Volume of growing stock[1] on commercial forest land by county and species groups,[2] northern Wisconsin, 1968
(Thousand cubic feet)

County	All species	Pine	Spruce & balsam fir	Other soft-woods	Oak	Yellow birch	Hard maple	Ash	Aspen	Basswood	Elm	Other hard-woods
					NORTHEASTERN UNIT							
Florence	233,903	9,993	22,642	28,645	5,980	20,169	41,420	2,931	55,134	14,086	15,089	17,814
Forest	448,965	18,620	63,152	63,493	4,195	17,262	76,164	10,468	76,132	46,460	28,874	44,145
Langlade	287,078	9,559	33,543	19,814	4,921	7,379	49,841	9,132	58,157	30,905	24,909	38,823
Lincoln	307,057	25,138	19,829	8,057	13,359	5,870	34,239	22,231	73,014	24,032	25,501	55,782
Marinette	485,826	49,074	31,560	46,516	57,078	2,512	22,215	24,419	119,677	16,929	25,075	90,771
Oconto	330,378	73,905	20,232	64,969	8,761	3,002	10,476	17,119	59,132	9,590	24,869	38,323
Oneida	482,240	86,260	81,552	41,317	39,794	6,620	15,318	9,275	111,532	5,593	4,851	89,128
Shawano[3]	576,241	70,666	12,277	111,540	45,844	22,522	82,783	29,885	44,517	28,535	57,962	69,710
Vilas	380,827	76,528	28,898	30,399	23,708	11,723	41,814	1,493	88,014	9,014	4,993	64,243
Unit Total	3,530,515	419,743	313,685	414,750	194,640	97,059	374,270	126,953	685,309	185,144	212,123	508,839
					NORTHWESTERN UNIT							
Ashland	422,105	20,540	41,491	47,345	22,112	13,620	50,947	25,217	88,590	30,478	16,851	64,914
Barron	122,378	7,292	5,759	5,617	14,512	2,947	13,414	6,944	31,545	9,077	6,249	19,023
Bayfield	572,308	95,369	32,635	23,787	52,006	13,169	52,211	25,525	139,459	31,284	16,906	89,957
Burnett	212,104	38,014	8,169	6,668	34,618	2,283	10,120	8,801	60,782	7,521	7,047	27,081
Douglas	384,311	59,178	28,282	19,616	26,797	6,020	24,553	17,943	117,441	17,514	14,394	52,575
Iron	290,443	11,913	24,505	21,267	19,118	7,963	34,578	20,374	63,777	23,874	17,159	45,915
Polk	162,484	21,686	5,988	5,119	33,686	2,149	8,599	6,138	43,442	6,636	5,972	21,069
Price	499,809	34,262	50,465	49,628	27,697	14,970	53,886	34,484	101,578	33,591	24,269	74,979
Rusk	244,292	11,574	14,007	11,099	19,308	5,783	27,002	15,413	68,801	18,786	13,130	39,389
Sawyer	470,745	34,357	39,365	31,806	30,075	11,574	45,085	25,960	130,816	28,677	18,691	74,339
Taylor	280,237	10,326	21,898	19,608	13,572	10,681	39,050	21,701	58,626	22,262	14,054	48,459
Washburn	238,896	30,999	12,324	9,101	24,601	3,658	16,282	11,992	74,615	11,613	9,504	34,207
Unit Total	3,898,113	375,510	284,888	250,662	318,102	94,817	376,727	220,490	979,472	241,313	164,226	591,907
Central Total (from table 2)	1,642,276	247,461	11,266	62,052	476,876	22,736	75,263	61,573	304,039	50,902	101,064	229,044
Southern Total (from table 2)	1,922,868	28,716	2,656	63,153	777,086	4,993	112,086	96,484	190,628	82,146	218,056	346,864
STATE TOTAL	10,995,772	1,071,430	612,495	790,616	1,766,704	219,605	938,346	505,500	2,159,448	559,505	695,469	1,676,654

Table 2. –Volume of growing stock[1] on commercial forest land by county and species groups,[2] central and southern Wisconsin, 1968
(Thousand cubic feet)

County	All species	Softwoods 2/	Oak	Yellow birch	Hard maple	Ash	Aspen	Elm	Other hardwoods 2/
				CENTRAL UNIT					
Adams	127,142	37,896	39,705	893	3,112	3,033	21,757	4,922	15,824
Chippewa	122,861	20,090	35,558	1,659	5,467	4,361	27,334	7,070	21,322
Clark	163,103	26,781	38,544	2,836	9,211	6,502	37,691	11,004	30,534
Eau Claire	90,479	16,519	31,466	798	2,899	2,520	18,478	4,092	13,707
Jackson	183,770	38,497	58,436	1,849	6,826	5,040	36,434	8,595	28,093
Juneau	139,380	31,355	44,090	1,406	4,337	5,285	23,139	7,916	21,852
Marathon	272,463	41,806	55,774	6,826	22,199	13,312	51,832	24,166	56,548
Marquette	53,617	10,443	19,640	427	1,390	2,022	7,979	3,065	8,651
Monroe	127,972	21,093	54,984	1,066	4,361	3,192	18,533	5,617	19,126
Portage	100,022	18,794	27,919	1,683	5,451	4,535	15,215	7,576	18,849
Waupaca	88,259	18,004	21,425	1,327	3,895	4,764	15,026	6,668	17,150
Waushara	66,076	13,762	23,755	679	2,228	2,386	9,256	3,713	10,294
Wood	107,132	25,739	25,580	1,287	3,887	4,621	21,362	6,660	17,996
Unit Total	1,642,276	320,779	476,876	22,736	75,263	61,573	304,039	101,064	279,946
				SOUTHWESTERN UNIT					
Buffalo	143,148	1,880	66,794	111	8,074	4,148	13,778	13,809	34,554
Crawford	107,930	1,130	50,947	95	4,945	2,836	13,027	9,686	25,264
Dunn	111,050	1,943	50,536	95	6,170	3,239	11,605	10,831	26,631
Grant	120,293	1,667	58,247	103	5,601	2,970	13,754	10,586	27,365
Iowa	90,645	5,017	40,519	63	3,982	2,315	10,080	8,050	20,619
La Crosse	81,804	1,130	38,907	55	3,705	2,291	8,303	7,853	19,560
Lafayette	28,851	632	14,354	24	1,390	703	3,105	2,481	6,162
Pepin	39,982	411	18,178	24	2,101	1,145	4,708	3,816	9,599
Pierce	53,175	553	26,876	47	3,350	1,224	5,475	4,661	10,989
Richland	84,024	1,438	40,100	79	5,388	2,125	8,177	8,105	18,612
St. Croix	41,649	853	18,549	24	2,046	1,003	7,742	3,223	8,209
Sauk	128,723	2,165	62,600	103	7,189	3,207	13,651	11,621	28,187
Trempealeau	89,104	1,351	43,023	79	4,685	2,244	9,440	8,011	20,271
Vernon	119,724	1,304	62,236	95	6,794	2,370	13,193	9,756	23,976
Unit Total	1,240,102	21,474	591,866	997	65,420	31,820	136,038	112,489	279,998
				SOUTHEASTERN UNIT					
Brown	32,777	3,950	4,424	284	3,049	3,840	2,149	7,410	7,671
Calumet	18,446	1,793	4,945	126	1,288	2,015	1,248	2,844	4,187
Columbia	60,285	4,116	24,016	237	3,034	4,424	5,198	6,525	12,735
Dane	57,394	1,793	29,301	150	2,876	2,844	3,500	4,748	12,182
Dodge	24,103	2,022	5,767	134	1,722	2,639	1,936	4,440	5,443
Door	85,265	20,248	7,244	616	6,359	8,137	11,400	14,647	16,614
Fond du Lac	30,210	3,350	8,571	158	1,588	3,176	2,449	4,266	6,652
Green	25,801	1,351	12,047	87	1,398	1,580	1,319	2,686	5,333
Green Lake	20,643	1,485	7,260	95	1,462	1,533	1,422	2,828	4,558
Jefferson	23,787	2,275	7,466	134	1,635	2,220	1,398	3,595	5,064
Kenosha	7,821	537	1,833	47	830	743	474	1,485	1,872
Kewaunee	26,512	3,729	3,547	205	2,528	3,168	2,077	5,467	5,791
Manitowoc	51,239	5,980	8,856	395	4,211	5,957	3,602	10,467	11,771
Milwaukee	--	--	--	--	--	--	--	--	--
Outagamie	45,780	5,538	8,129	348	3,128	5,980	3,871	8,279	10,507
Ozaukee	9,472	916	2,275	55	592	822	1,359	1,288	2,165
Racine	12,506	933	2,465	87	1,098	1,311	1,043	2,496	3,073
Rock	22,831	727	10,609	79	1,359	1,503	1,359	2,323	4,874
Sheboygan	34,270	4,305	8,248	205	2,315	3,523	3,326	4,930	7,418
Walworth	19,940	1,249	6,675	103	1,406	1,825	1,296	2,962	4,424
Washington	30,684	2,891	6,233	253	2,504	3,642	1,375	6,407	7,379
Waukesha	27,050	3,073	10,135	111	980	2,228	2,236	2,812	5,475
Winnebago	15,950	790	5,174	87	1,304	1,556	553	2,662	3,824
Unit Total	682,766	73,051	185,220	3,996	46,666	64,664	54,590	105,567	149,012

See footnotes on page 4.

Table 3. –Volume of sawtimber[1] on commercial forest land by county and species groups,[2] northern Wisconsin, 1968
(Thousand board feet)[3]

County	All species	Pine	Spruce & balsam fir	Other soft-woods	Oak	Yellow birch	Hard maple	Ash	Aspen	Basswood	Elm	Other hard-woods
					NORTHEASTERN UNIT							
Florence	504,039	28,479	27,016	130,027	7,032	81,669	126,109	2,078	28,474	25,134	40,712	7,309
Forest	791,849	54,619	66,408	248,466	8,431	58,547	169,794	8,700	57,960	46,707	42,135	31,082
Langlade	500,221	31,545	39,962	49,474	11,875	23,842	162,480	9,151	45,776	33,073	57,301	31,742
Lincoln	557,306	114,814	18,587	34,369	26,493	16,391	86,547	46,310	37,384	37,199	84,217	54,995
Marinette	891,005	198,773	38,993	169,642	86,982	7,721	73,495	16,093	115,289	21,621	55,575	106,819
Oconto	716,974	166,573	23,323	93,079	59,185	8,792	20,249	58,911	71,732	17,860	118,948	78,322
Oneida	966,649	410,951	67,589	180,889	55,606	32,329	35,747	6,984	103,094	9,864	11,796	51,800
Shawano[4/]	1,637,642	309,292	10,749	392,329	116,410	59,465	284,025	42,857	50,446	80,916	164,213	126,940
Vilas	735,999	284,445	26,551	133,576	38,634	40,692	81,675	1,162	74,822	9,256	5,260	36,548
Unit Total	7,301,682	1,603,491	319,178	1,432,251	410,628	329,448	1,040,121	192,246	584,977	281,628	579,157	526,557
					NORTHWESTERN UNIT							
Ashland	651,481	69,545	47,372	139,438	38,161	32,555	65,568	32,310	92,937	43,527	40,891	49,177
Barron	204,412	24,929	9,566	21,230	26,496	9,374	22,537	9,173	36,549	13,916	16,086	14,556
Bayfield	844,308	215,702	48,781	87,494	58,916	33,530	66,419	38,400	144,409	48,054	42,087	60,516
Burnett	292,939	64,267	12,163	20,057	55,191	7,395	16,975	10,646	61,354	11,347	17,484	16,060
Douglas	534,483	115,165	37,719	53,874	41,687	18,931	38,874	21,895	112,453	25,922	34,484	33,479
Iron	482,476	52,006	33,239	66,560	35,623	24,687	54,409	26,924	74,280	35,095	43,251	36,402
Polk	267,072	48,175	10,325	17,877	62,648	7,423	18,502	7,713	52,013	11,218	16,067	15,111
Price	894,095	138,193	65,093	145,192	56,554	45,399	87,478	52,940	114,290	55,773	65,334	67,849
Rusk	376,855	45,308	21,698	38,627	33,465	17,604	41,613	19,779	72,159	26,926	32,228	27,448
Sawyer	702,867	121,107	50,989	92,897	46,805	30,057	61,697	33,441	129,760	40,634	45,665	49,815
Taylor	435,134	39,031	29,219	62,931	23,468	24,973	46,396	33,289	62,830	34,566	35,440	42,991
Washburn	337,019	65,492	18,437	27,771	38,278	11,312	25,777	14,874	73,834	16,732	23,442	21,070
Unit Total	6,023,141	998,920	384,601	773,948	517,292	263,240	546,245	301,384	1,026,868	363,710	412,459	434,474
Central Total (from table 4)	3,249,102	683,476	7,720	119,597	1,173,386	40,478	203,139	93,685	213,585	127,251	299,124	287,661
Southern Total (from table 4)	5,181,820	64,032	3,539	106,450	2,704,689	8,802	329,957	178,403	283,759	233,274	615,798	653,167
STATE TOTAL	21,755,745	3,349,919	715,038	2,432,246	4,805,995	641,968	2,119,462	765,718	2,109,189	1,005,813	1,906,538	1,903,859

Table 4. –Volume of sawtimber[1] on commercial forest land by county and species groups,[2] central and southern Wisconsin, 1968
(Thousand board feet)[3]

County	All species	Softwoods 2/	Oak	Yellow birch	Hard maple	Ash	Aspen	Elm	Other hardwoods 2/
				CENTRAL UNIT					
Adams	234,402	70,533	95,960	1,563	8,737	4,893	15,048	15,027	22,641
Chippewa	224,317	56,202	79,264	2,824	14,345	5,766	18,473	19,775	27,668
Clark	306,826	81,634	89,642	4,981	24,492	8,916	23,860	31,295	42,006
Eau Claire	174,828	46,190	73,275	1,342	7,582	3,645	12,875	11,750	18,169
Jackson	339,162	93,317	133,640	3,167	17,714	7,032	24,636	24,507	35,149
Juneau	281,361	67,754	114,082	2,376	12,182	8,572	16,913	24,357	35,125
Marathon	577,480	127,003	149,652	13,396	61,166	22,257	36,723	73,764	93,519
Marquette	117,412	26,064	53,406	647	3,966	3,328	6,202	9,564	14,235
Monroe	278,083	65,568	135,592	1,825	11,508	5,128	15,734	16,554	26,174
Portage	215,182	49,827	74,044	3,151	14,952	7,569	11,295	23,097	31,247
Waupaca	171,025	45,087	51,483	2,091	10,149	6,490	10,409	18,992	26,324
Waushara	143,768	32,451	64,139	1,194	6,306	3,967	7,376	11,601	16,734
Wood	185,256	49,363	59,207	1,921	10,040	6,122	14,041	18,843	25,921
Unit Total	3,249,102	810,793	1,173,386	40,478	203,139	93,685	213,585	299,124	414,912
				SOUTHWESTERN UNIT					
Buffalo	406,468	4,773	232,621	290	25,318	9,855	25,217	36,213	72,181
Crawford	288,695	3,327	171,013	218	15,247	6,199	20,896	24,375	47,420
Dunn	303,749	4,021	171,557	230	19,316	7,242	20,170	28,037	53,176
Grant	324,837	3,943	195,808	260	17,341	6,683	23,543	26,642	50,617
Iowa	231,416	2,860	134,280	168	12,280	5,072	16,357	19,910	40,489
La Crosse	230,319	2,470	133,883	179	11,612	5,497	15,790	20,492	40,396
Lafayette	82,334	1,075	50,610	63	4,405	1,625	5,853	6,349	12,354
Pepin	111,649	1,208	62,922	84	6,574	2,803	7,771	10,116	20,171
Pierce	154,283	1,686	94,613	127	10,661	2,984	10,429	12,420	21,363
Richland	235,290	3,632	139,349	176	16,813	4,838	14,728	20,491	35,263
St. Croix	106,378	1,452	63,093	89	6,462	2,123	9,200	8,533	15,426
Sauk	364,253	4,241	219,394	277	22,681	7,514	24,236	30,280	55,630
Trempealeau	248,464	3,288	147,744	196	14,721	5,260	16,919	20,429	39,907
Vernon	332,553	3,926	212,144	278	21,339	5,291	24,143	24,113	41,319
Unit Total	3,420,688	41,902	2,029,031	2,635	204,770	72,986	235,252	288,400	545,712
				SOUTHEASTERN UNIT					
Brown	87,729	7,589	16,700	508	8,545	7,130	2,316	24,379	20,562
Calumet	47,294	3,524	17,757	173	3,404	3,188	1,185	8,505	9,558
Columbia	159,947	6,576	86,949	347	7,919	6,847	5,035	19,551	26,723
Dane	161,916	4,244	102,855	182	7,404	4,587	5,087	14,331	23,226
Dodge	63,372	3,376	21,517	223	5,057	4,633	1,569	13,640	13,357
Door	177,249	33,333	27,116	818	16,433	12,873	5,805	44,541	36,330
Fond du Lac	75,979	6,427	30,966	210	4,366	5,066	1,757	12,223	14,964
Green	75,375	2,170	44,706	133	3,580	2,568	2,177	8,532	11,509
Green Lake	58,794	3,161	27,318	131	4,352	2,661	1,485	8,919	10,737
Jefferson	65,788	4,258	28,368	202	4,561	3,701	1,443	11,220	12,035
Kenosha	21,979	1,120	6,998	99	2,234	1,371	475	4,897	4,785
Kewaunee	64,778	6,853	13,272	360	6,056	5,255	1,585	17,237	14,160
Manitowoc	133,626	10,958	32,991	759	12,053	9,834	3,126	34,121	29,784
Milwaukee	—	—	—	—	—	—	—	—	—
Outagamie	110,892	10,854	29,082	517	8,599	9,319	3,129	24,663	24,729
Ozaukee	21,888	1,775	8,187	58	1,529	1,192	973	3,779	4,395
Racine	33,908	1,935	9,260	159	3,111	2,396	805	8,387	7,855
Rock	66,806	1,849	39,035	93	3,693	2,571	2,025	7,064	10,476
Sheboygan	79,395	6,573	29,300	288	5,411	5,148	2,275	14,749	15,651
Walworth	54,214	2,632	24,404	169	3,496	3,011	1,317	9,215	9,970
Washington	86,316	5,931	23,619	445	7,441	6,341	1,754	21,237	19,548
Waukesha	67,434	4,919	36,291	117	2,335	3,131	2,428	7,688	10,525
Winnebago	46,453	2,032	18,967	176	3,608	2,594	756	8,520	9,800
Unit Total	1,761,132	132,119	675,658	6,167	125,187	105,417	48,507	327,398	340,679

See footnotes on page 4.

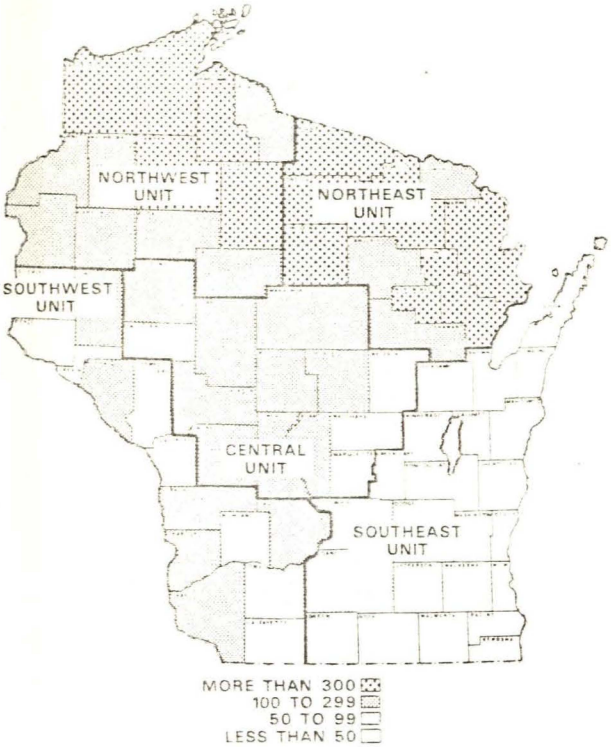

Figure 1. –Growing stock volume in Wisconsin counties, 1968, in million cubic feet.

The major concentrations of timber are found in the northern one-third of the State (the two northern survey units). This area contains two-thirds of the State's growing stock and over 60 percent of its sawtimber. The heavily forested counties are found here, the majority of them more than 70 percent forested and with volumes exceeding 300 million cubic feet (see map on back page). Eighty percent of the jack pine, spruce, balsam fir, hemlock, and aspen volumes are located here.

These statistics are based on results from the cooperative Forest Survey conducted from June 1967 to December 1969 by the North Central Forest Experiment Station and the Wisconsin Department of Natural Resources. This is one of a number of reports that will be prepared to make these resource statistics available.

Sampling error (at one standard deviation) is estimated to be ± 0.86 percent for the growing stock volume in the State. The sampling error doubles as the volume is divided by four.

ARNOLD J. OSTROM
Associate Mensurationist

1972

TABLE 1:

[1] Net volume of all live merchantable trees 5 inches d.b.h. and larger from the stump to a variable 4-inch top diameter outside bark of the central stem. Does not include limbs or cull tree volume.

[2] Species groups: Other softwoods — primarily hemlock, tamarack and northern white cedar. Oak — primarily white oak, bur oak, northern red oak, northern pin oak and black oak. Ash — white, black and green ash. Elm — American, slippery and rock elm. Other hardwoods — primarily paper birch, hickories, red maple, beech, balsam poplar, cottonwood, butternut, black cherry, and black willow.

[3] Volumes for Menominee County have been combined with Shawano County.

TABLE 2:

[1] Net volume of all live merchantable trees 5 inches d.b.h. and larger from the stump to a variable 4-inch top diameter outside bark of the central stem. Does not include limbs or cull tree volume.

[2] Species groups: Softwoods — primarily white, red, jack pine, balsam fir, hemlock, tamarack and northern white cedar. Oak — primarily white oak, bur oak, northern red oak, northern pin oak and black oak. Ash — primarily white, black and green ash. Elm — American, slippery and rock elm. Other hardwoods — primarily basswood, paper birch, hickories, red maple, silver maple, beech, balsam poplar, cottonwood, butternut, black walnut, black cherry, black willow and boxelder.

TABLE 3:

[1] Net volume of live merchantable sawtimber trees (softwoods 9.0 inches d.b.h. or larger and hardwoods 11.0 inches d.b.h. and larger) from the stump to a point in the central stem at which utilization for sawn products is limited by large branches, forks, or other defects, or by a diameter outside bark 7.0 inches for softwoods and 9.0 inches for hardwoods.

[2] Species groups: Other softwoods — primarily hemlock, tamarack and northern white cedar. Oak — primarily white oak, bur oak, northern red oak, northern pin oak and black oak. Ash — white, black and green ash. Elm — American, slippery and rock elm. Other hardwoods — primarily paper birch, hickories, red maple, beech, balsam poplar, cottonwood, butternut, black cherry, and black willow.

[3] International ¼-inch rule.

[4] Volumes for Menominee County have been combined with Shawano County.

TABLE 4:

[1] Net volume of live merchantable sawtimber trees (softwoods 9.0 inches d.b.h. or larger and hardwoods 11.0 inches d.b.h. and larger) from the stump to a point in the central stem at which utilization for sawn products is limited by large branches, forks, or other defects, or by a diameter outside bark 7.0 inches for softwoods and 9.0 inches for hardwoods.

[2] Species groups: Softwoods — primarily white, red, jack pine, balsam fir, hemlock, tamarack and northern white cedar. Oak — primarily white oak, bur oak, northern red oak, northern pin oak and black oak. Ash — primarily white, black and green ash. Elm — American, slippery and rock elm. Other hardwoods — primarily basswood, paper birch, hickories, red maple, silver maple, beech, balsam poplar, cottonwood, butternut, black walnut, black cherry, black willow and boxelder.

[3] International ¼-inch rule.

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